
Air Dispersion Models at the EPA

Dennis Atkinson



EPA Models

- **Screening Models**
- **Regulatory Models**
- **Other Models (non-regulatory)**
- **Models under review by public**
- **Non-EPA Models**

Screening Models

- **Provide a simple tool to determine compliance with regulations, such as**
 - **National Ambient Air Quality Standards (NAAQS) [CO, PB, NO₂, Ozone, PM-10, SO₂]**
 - **Prevention of Significant Deterioration (PSD) permits**
 - **State Implementation Plans (SIP)**

Screening Models

- **SCREEN3** - used for point, area, and volume sources; ISCST3 complement
- **TSCREEN** - used for toxic applications; contains 3 models: **SCREEN3**, **RVD (Relief Valve Discharge)**, **PUFF**
- **CTSCREEN** - complex terrain model; **CTDMPLUS** complement
- **RTDM** - **Rough Terrain Dispersion Model**
- **Others: VISCREEN, COMPLEX1, VALLEY, LONGZ, SHORTZ**

Regulatory Models

- **More sophisticated tool (refined) for determining compliance with NAAQS, PSD, SIPS, FIPS**

- **Require additional information from the user, such as**
 - **meteorological data**
 - **receptor locations**
 - **terrain data**
 - **deposition/particle information**

Regulatory Models

- **ISCST3 - Industrial Source Complex Short Term 3; EPA "workhorse" model since 1988**
- **CAL3QHC - CALINE3 with intersection queuing and hot spot calculations**
- **UAM - Urban Airshed Model**
- **CTDMPLUS - Complex Terrain Dispersion Model PLUS algorithms for unstable situations**
- **OCD - Offshore and Coastal Dispersion model**
- **BLP - Bouyant Line and Point source model**
- **Others: CALINE3, CDM2, EKMA, RAM**

Other Models

- **Models which, with approval by EPA, may be viable tools on a case-by-case; usually developed by EPA and/or EPA contractors; also has not undergone the procedures for "regulatory"**
- **"Other Models" - usually have guidance documents associated with their use**

Other Models

- **DEGADIS - Dense Gas Dispersion model**
- **CMB7 - Chemical Mass Balance 7 model**
- **PLUVUE - Plume Visibility model**
- **SDM - Shoreline Dispersion Model**
- **MESOPUFF - Mesoscale Puff Model**
- **RPM - Reactive Plume Model**

Models under Review/Comment

- **Models/tools that are newly developed and are available for public availability, but are not currently classified as regulatory**
- **Intermediate products of new algorithms or models that may be beneficial to the modeling community**

Models under Review/Comment

- **ExInter - Expert Interface for the TSCREEN model**
- **REMSAD - Regulatory Modeling System for Aerosol and Deposition**
- **ISCOLM - ISCST3 Ozone Limiting Method model**

Non-EPA Models

- **Models that are of general interest to EPA model users but are NOT maintained by EPA**
- **Non-EPA models - provided as a "one-stop shopping" convenience to modelers**

Non-EPA Models

- **SLAB** - Air Force dense gas dispersion model; developed by LLNL; 1-dimensional solver
- **ADAM** - Air Force dense gas dispersion model; incorporates thermodynamics and pressurized releases
- **AFTOX** - Air Force Toxics model
- **OBODM** - Open Burn/Open Detonation model; developed by the Army

Model Availability

- **SCRAM website - Support Center for Regulatory Air Models**

www.epa.gov/scram001

- **Users include:**
 - **industry -- manufacturing sources**
 - **environmental consultants**
 - **environmental activist groups**
 - **litigants**
 - **local/state/federal gov. agencies**

Model Training

- **Self-training**
 - SCRAM models contain example input and output files
 - Several model tutorials available via SCRAM
- **Model Workshops - instruction provided by the Air Quality Modeling Group**
- **Education and Outreach Group - establishes training for new and existing models**

R & D Activities

- **AERMOD - proposed replacement for ISC3**
- **CALPUFF - long-range transport model**
- **Models-3 - Multiscale Air Quality modeling system**

EPA Air Modeling Questions?

- Consult the SCRAM website
 - models
 - modeling guidance
 - user's guides
 - meteorological data
 - contacts for State and Regional EPA offices
 - Public Forum area

- SCRAM Manager - Dennis Atkinson;
atkinson.dennis@epa.gov